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USAID KOSOVO PRIVATE ENTERPRISE PROGRAM (KPEP)

Training Interns in Milk Quality Field Work

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TRAINING INTERNS IN MILK QUALITY FIELD WORK

Kosovo Private Enterprise Program project Standards of Identity for Milk and Milk Products.
Contract No. No. EEM-I-07-00007-00, TO #2

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PURPOSE OF ASSIGNMENT

Engagement Objectives

Primarily responsible for training 10 students-interns from the Veterinary Faculty of the University of Prishtina and for training a consultant from the local consulting company "Grima", Mr. Gursel Arifi.
The consultant's main objectives were:

- Develop a raw milk quality training program for fourth and fifth year student interns;
- Conduct the training program with as much field training as time permits;
- Work with the local dairy consultant to develop on the job training for the interns in the future;
- Develop field observation schedule for the local consultant;

The objective with local dairy consultant Mr. Gursel Arifi from "Grima" business consulting company was to train the consultant who has dairy experience, to be able to conduct the training of interns in the next rotation of the program.
For achieving these objectives the following tasks were included:

- Review of the tests results that dairy processors receive from the raw milk testing laboratory;
- Visit the dairy processors partners, farms, Veterinary Faculty and other site visits;
- Develop the schedule and materials for the training and conduct the training for raw milk quality student interns to serve as milk quality field personnel placed in dairy processing facilities;

BACKGROUND

Although the country has favorable natural conditions for milk production, the local industry needs to consolidate farms for greater efficiency, and further increase processing quality and consistency in order to compete effectively with imported products. The development of dairies is a key factor for success in the whole dairy sector.

The Kosovo dairies supply a very limited range of dairy products to the domestic markets. In response to increased competition from imports, local dairy processors are attempting to develop new products of their own. Processors need to upgrade and standardize their processing practices to improve the quality and consistency of finished products, increase production efficiency and reduce costs. This new developed products require higher quality raw milk and better milk handling, manufacturing, and distribution practices.

Farmers and Milk Collection Centers are not segregating good quality raw milk supplies from lower/poor quality. Farms sell milk to one of the registered dairy processors. Two systems are currently in place for the collection of raw milk. From larger dairy farms the milk is collected directly by the dairy processors, while smaller farmers bring it to central milk collection centers. Then it is transported to the dairy plant either by the processors or by intermediaries. A large number of small dairy farmers make milk collection expensive especially in the case of quality of raw milk.

This results in both diminishing overall raw milk supply quality, and hurts farmers who invest in milking equipment to ensure good quality. Greater invests need to be put in place to encourage both quality processes and a consolidation of farms into larger entities that can capture economies of scale to take the proper steps to ensure high quality. Still, it is believed that dairy industry to be a very important contributor to the local population's diet and Kosovo's future economic development.

Processors are limited by inefficient, manual manufacture lines which result in high costs of production and limited margins. As a result, they do not have the funds to invest in facility modernization or expansion, nor in education and training or adopting new technology. Consumer and retailers express strong sentiments regarding supporting produced dairy products. However, they have had bad experience in the past with inconsistent/low product quality, which has resulted in them favoring imported brands. Now even with local quality improving it is difficult to get consumers to switch back to locally produced products.

In addition, because of the limited range of products offered by domestic processors, consumer is forced to buy imported products. The challenge for domestic processors is made greater by the fact that consumers have a long history of using brands from Slovenia and Croatia. They have good experience with these products, and remain loyal to them as a result.

All this lead to conclusion that dairy sub-sector is currently not competitive. The initial break through point in moving the value chain into a competitive position is addressing raw milk quality. Dairy processors have not made the investment in human resources to provide support to farmers and milk collection centers that are plagued with quality issues. Commonly it is estimated that 10 % of the raw milk source causes 90 % of the problem and investing in the raw milk quality improvement may generate quick and impressive results.

The milk decree is the first step in instituting international quality standards and improving the safety of dairy products in Kosovo. Due to quality concerns, processors prefer to buy from individual farmers under contract. Same visited processors "Devolli", "Magic Ice" plants to reduce collection of raw milk from the milk collection centers because of low quality milk and seasonal increasing or raw milk production.
Ministry of Agriculture Forestry and Rural Development-MAFRD's most significant success to date in support of a competitive and safe dairy industry in Kosovo is the administrative

instruction regarding raw milk quality issued in 2006 which established bacterial and somatic cell count standards for four classes of raw milk. **Annex I** and **Annex II.**

The decree provides an economic incentive for producers to improve raw milk quality and thus addresses one of the main functional weaknesses in Kosovo's dairy value chain: the insufficient quantity and quality of raw milk.

All farmers indicated that the milk decree provides an adequate incentive for them to improve quality, but only if it is enforced and the test laboratory is objective. The decree requires processors to send samples from each producer or milk collection center twice per month to the Kosovo Food and Veterinary Agency (KVFA) laboratory for testing. The KVFA laboratory is still very much under construction and this too is limiting the capabilities to do more samples. Results are being sent back to the companies who are purchasing the milk and they then set payments to their farmers based on these limited tests. Producers are not really happy about this and feel in some cases they are not being treated fairly because testing or payment calculations are not accurate. It is obvious that this problem will need to be addressed by more testing and sharing of results.

Processors and producers depend on each other to improve the quality and quantity of their respective outputs trough different level of collaboration and in this activity every support from intuitional organization, University, and collaboration with agriculture projects and especially dairy associations is more than necessary.

However, to compete effectively, Kosovo's dairy sector needs to improve the quality of raw milk, improve the quality of finished products, with conformation of international standards trough developing of different range of dairy products and more added value products.

EXECUTIVE SUMMARY

The basis of the technical assistance was education and training to the student interns on milk quality control to serve as raw milk quality field personal at dairy processing facilities. Training was implemented with collaboration of five different dairy plants: ABI, Bylmeti, Devolli, Magic Ice, and Kabi and farms on their choice where we had practical training.
During the period of 20 working days project implementation was realized with training activity on a farm level at the processor level and educational workshops.
Training was designed to ensure that student interns will be properly skilled to educate the farmers on proper farm practice and will provide assistance in MCCs for milk handlers and at dairy plants during collection and transport of raw milk for transportation personnel.
On educational workshops in the period of 4 working days during the first week of training we covered all important topics related to Milk Quality and important lecture for every day operating on field: Production of quality milk and what is important to quality control on a farm level, control during storage of milk, control during collection of raw milk, control during transport of raw milk and milk reception at dairy plant and proper interpretation of laboratory results.
Main covered lectures during the educational workshops were: EU Regulation and Kosovo quality standards and grade of raw milk (Annex I and Annex II), Milk quality –what is milk and production of quality milk, milking solutions, milking procedures and equipment sanitation, milk handling and storage, MCC (Milk Collection Centers), transport of raw milk and milk collection route, milk payment, mastitis, sampling and sampling handling, filed methods/tests for milk quality control, tasting of milk in the dairy plant, milk falsification, independent lab for testing of raw milk.
During traning activity on a farm level the main topic was "Production of quality raw milk" with the following sub topics: hygiene in farm, milking hygiene, proper milking procedure, proper cleaning of the milking and other equipment, cooling of the milk and mastitis at dairy cows.
All procedures that are important for production of the quality milk were practically demonstrated. Also, all critical points that affect the microbiological quality of the milk were pointed out starting with preparation of the cows for milking, during milking, storage and selling of the milk. At visited farms, cows were tested with CMT, after which, the proper interpretation of results were demonstrated. All procedures for which there was a chance for practical demonstration were repeated by the students. After the training all students received the basic tools for Mastitis determination CMT-kit, and written procedure for proper milking and procedures for proper cleaning of milking equipment.
At milk collecting centers training was conducted for students in order to be able to control them or farmers who brings the milk at collecting centre. The goal was to demonstrate procedures for maintaining good hygienic level at the collecting centre and to maintain the milk quality up to the moment of delivery to the dairy plant. The following topics were included in the training: choosing proper cleaning chemicals for cleaning the enterer, equipment and utensils; choosing equipment for cleaning the enterer and milk equipment; procedure for cleaning the milk equipment; disinfection of the enterer, equipment and utensils; proper sampling for microbiological and chemical analysis;
Also at some milk collection centers proper usage of Lacto scan and other equipment at MCCs was demonstrated to student interns.
During training activity at dairy plant “Bylmeti” at the time of receiving of milk at milk reception point training was performed for students in order to see all procedures during milk receiving and testing at the dairy plant especially: Proper sampling, Control of the temperature during intake of the raw milk, Testing of raw milk with Beta-Star antibiotic test, and Usage of Lacto- scan for determination of the chemical parameters of the milk.
With the students during educational workshop we reviewed the Kosovo standard for raw milk regulation –“Quality Standards and grade of Fresh milk” and Decision “On grading of fresh milk of the cows, sheep and goats under the number of micro - organisms and somatic

cells" and influence of those regulation on the payment system. Based on guidelines set by the Ministry of Agriculture, Forestry and Rural Development (MAFRD) in Decision on previous mentioned article processing firms pay farmers 0.09 € per 1 % of milk fat in a liter of milk. With the average fat content of 3.5 % the average price is 0.315 € with up to -20% (correction 0.80) and up to 15 % (correction 1.15) price premium for high quality. Also in 2009 raw milk should be graded with the norms from 2008 which is agreed with the MAFRD.
They were also presented with the European standards for raw milk quality for collection and transport and also the standards for premises for intake and further process of the milk.
The program for educational and training of student interns was well received by the farmers and managers of dairy plants, and provided a valuable opportunity for educational interaction between the farmers, representatives of dairy plants and student team members. Farmers believed that this program can be best for improving of raw milk. Especially with the new quality standards for raw milk students will serve as independent part in interpretation of laboratory results and with objective role they will contribute to consolidation of farms in production of high quality raw milk and better understanding of standards of raw milk. Everyone involved learned and benefited from this experience.

FIELD ACTIVITIES TO ACHIEVE PURPOSES

Training was implemented with collaboration of five different dairy plants:

- ABI,
- Bylmeti,
- Devoll,
- Magic Ice,
- Kabi

All farms on dairy choose the location of the practical training.
During the period of 20 working days project implementation was realized with main training activity on:

- Farm and MCCs level,
- Processor level and
- Educational workshops.

June 2, 2009 at conference room KPEP

Together with Arben Musliu held a meeting with Mr. Gursel Arifi from Grima Business consulting Company and Professor Afrim Hamidi from the Veterinary faculty. On the meeting we developed agenda for the training and determined specific lecture about milk quality control for the student interns who will serve as milk quality field personnel. Training program included activity on a farm level, processor level and educational workshops. A schedule of activities for realization of the projected tasks was agreed on the first working day and all the necessary technical pre-requisites for work were discussed.
At the meeting it was also agreed that the different phases of the project will consist off:

- Evaluation of the existing dairy processing problems, farms' conditions and national laboratory for testing of raw milk quality (total number of farmers the dairy plant cooperates with; problems with collection of milk; existing milk quality control on the field, way of purchasing of milk and payments) and
  Introducing to the owners and managers of selected dairy plants with the details of student training program and how training will be conducted on the field;
- In the second phase, training should be conducted at first as:
  - ✓ **education training and workshops for student interns that will include the following topics**:
    - EU Regulation and Kosovo quality standards and grade of raw milk (Annex I and Annex II)
    - Milk quality –what is milk and production of quality milk
    - Milking Solutions
    - Milking Procedures and equipment sanitation
    - Milk handling and storage
    - MCC (Milk Collection Centers)
    - Transport of raw milk and milk collection route
    - Milk payment , Mastitis
    - Lecture on sampling and sampling handling
    - Filed methods/tests for milk quality control
    - Tasting of milk in the dairy plant
    - Milk falsification
    - Independent Lab. for testing of raw milk

At the third phase the training should be conducted for the student interns at one dairy plant and the different farms that will include the following topics:

At farm level production of quality raw milk:

- Farm hygiene,
- Hygiene of the milker,
- Udder hygiene and milking hygiene,
- California Mastitis tests,
- Raw milk cooling and storage of raw milk,
- Cleaning of milking equipmen.

At dairy level at the reception unit at the dairy plant and dairy laboratory:

- Collection and Transport of raw milk,
- Performance of AB (Antibiotic Tests) for determination of presents of Antibiotics and other inhibitors of milk,
- Other tests for milk quality performed at dairy laboratory,
- Equipment for sampling and testing,
- Measuring raw milk quantity,
- Record keeping and interpretation of the lab results.

June 3, 2009 Dairy laboratory which is a part of the Kosovo Veterinary and food Agency (KFVA) and Ministry of Agriculture, Forestry and Rural Development

At the meeting with Ms. Drita we discussed about service which they provided to dairy farmers and milk processors. They have lab equipment from Denmark-Foss (Milkoscan, Fossomatic and Bactoscan) and conduct 2,000 to 3000 analyses per month, primarily from 14 licensed dairies. They test for IBC - Individual Bacteria Count and SCC somatic Cell Count also for freezing point, density, total solids and other chemical compounds of milk like: fat, proteins, and lactose. Bottles for samples collection get to the dairies on Friday afternoon than samples are collected at the MCC on Monday delivered to the lab for analysis the same day. Sampling is one of the biggest issue and we get impression that the lab has very sensitive position between Processors and Producers. Farmers complain regularly about sampling and not receiving information about tests results from the dairy. In the meeting we presented planed project activity with students and we arranged visit of the laboratory in the coming weeks.

"FAUNA" veterinary drugstore-chemist's shop in Pristina

Visited local Veterinary and Agriculture shop 'Fauna" to see possibility of supplying farmers with mastitis tests and a disinfectant for after milking which is universally recognized method of preventing mastitis and solution for sanitation of equipment. They have on stock only disinfectants and different mastitis test bud have not alkaline or acid solutions which are necessary in every day cleaning procedures.

KPEP Office in Pristina

Browsed the official website of the Ministry of Agriculture, Forestry and Rural Development (MADRD) and UNMIK official website for information about Kosovo veterinary law, Kosovo livestock law and other approved quality standards especially related to quality of raw milk and milk production.

June 4, 2009
Faculty of Veterinary Medicine Pristina

Introduction meeting with students selected for training who will work with the five dairy processing plants at the faculty of Veterinary medicine. We made a small presentation of proposed agenda for each lecture from the training and we discussed about the details of the training. A schedule of activities for realization of the projected tasks was agreed and all the necessary technical pre-requisites for training were discussed.
Students show big interest for the implementation of the payment system according to the microbiological quality and for supported mechanisms in agriculture production in EU country and particularly for the neighboring countries.
We will cover also those topics during our training lecture.

Dairy Plant "Bylmeti" Pristina

During our visit to "Bylmeti" dairy plant in Pristina, we had a meeting with Mr. Arifi who is one of the owners. We informed him about the planned activities of the project and the main goal that is upgrading the knowledge and improving the skills of the students on milk quality control. We agreed to determine more farms of their choice where we can have training and have practical training for student interns.
The representative form "Bylmeti" dairy plant gave us the following data: "Bylmeti" has implemented HACCP standards and the company has provided free lactofreezers to some farmers.
At the moment they collected 20.000 liters of raw milk from 104 individual farmers covered with agreement for purchasing of raw milk and 4 milk collecting centers. Summer milk supplies from their farmers and milk collection center contracts multiplies and they sometime collaborate with Devolli for selling milk when is possible. Also they have been investing in waste water station in amount of 50.000,00 Euro. We discussed with manager and about possibilities for future collaboration with the students on the farm level and assistance and milk collection from the field.
He gave us list of the 23 most problematic farms where practical training will be held.
He also asked about possibility for participation of one or two employees from Bilmeti dairy plant on the training together with students.

June 5, 2009 Dairy Plant "ABI" Prizren

Meeting with Mr. Alajdin Fusha, owner of ABI dairy plant, to discuss KPEP project activity for training of student interns and best ways for collaboration with his company in the future. ABI has existing relationships with more than 500 farmers with average production of 40 liters of raw milk per day. Almost 99 % do not have own milk cooling tanks they supplied dairy trough

MCC, collected from seven different field routes. Hi gave us list of farmers with contact phone numbers and contacts from raw milk employee responsible for milk collection.
He also told us that they have not finished privatization process yet with Kosovo Agency of Privatization. In additional they also plan when this process will finished to start with registration procedure for obtaining export number and that is the one reason more for they need of collaboration with trained students in Milk Quality Training program.

June 8, 2009,
Dairy Plant "Devolli" Pejë/Peć

Together with Arben Musliu and Gursel Arifi from Grima Business Consulting Company a meeting was held with the owner of dairy plant Devoli. We informed him about planned activities of the project and the main goal that is training of the student interns and improving the skills of the students to serve as quality field personnel.
We agreed to determine different farms of their choice where we can have training and milk quality control at the next phase of projects. The representative form Devolli dairy plant gave us the following data: The dairy processes UHT milk; they have around 200 cooperators; daily quantity of the collected milk is around 25.000 liters; the payment system is according to the microbiological quality since they have their own laboratory capable for this type of tests and now according KFVA Laboratory performed tests. They permanently have problems with milk quality from most of the farmers and recently started with restriction of collection of raw milk from MCC.

Dairy plant "Magic Ice" Pristina

During our visit to Magic Ice dairy plant we had meeting with the owner and discussed about proposed training program. At the moment they collect raw milk mostly from milk collecting centers. Also he expresses strong commitment for future collaboration with the students for their assistance with milk quality control on farm level, during collection from the field and transport of the raw milk.
He gave us list of the MCC with problematic farms where practical training will be held.
Magic Ice sees raw milk quality as major threat for their business and also GHP (Good Hygiene Practice) need to be facilitated in implementation of MCCs of this internship students program.
Other major threats for their business especially with ice cream program is big international competition highly marketing support and existing trade laws.

June 9-10-11, 2009

Workshop for: Training Interns in Milk Quality Field Work
Location: conference room at KPEP, Pristina
Perform workshops whith 10 students attending from the faculty of Veterinary medicine and one employee from Bylmeti dairy plants.

Main topic of the workshops was lecturing about:

EU- History of dairy politics, farm structure and dairy

EU Dairy Industry and USA dairy industry review in order to have knowledge about European and world trends in milk production. Milk production in the EU is still subject to quotas. The quota system was instituted in 1984 and gives individual producers limits for volume of production and prolongation of dairy regime to 2013/2014.

Especially we discussed about farm gate milk price, agriculture polices (CAP), internationalization of Dairy companies and Trade companies.

EU Regulation and Kosovo quality standards and grade of raw milk

In General EU Law is composed of Primary Legislation and Secondary Legislation and community law may take the following forms: EU Regulation, EU Directives, EU Decisions.
General food Law – regulation 178/2002 with placing the responsibilities on Food Business Operators: Safety, Responsibility, Traceability, Transparency, Emergency, Prevention, Co-operation.
Regulation 852/2004 on the hygiene of foodstuffs – ensure the hygiene of food stuffs at all stage of the production process;
Regulation 853/2004 lays down specific hygiene rules for food of animal origin and ensure a high level of food safety and public health.
Regulation 853/2004 at Section IX: Raw Milk and Dairy Products
Hygiene on Milk production holdings:

A. Requirements for premises and equipment
B. Hygiene during milking, collection and transport:
C. Staff hygiene

CRITERIA FOR RAW MILK-Food business operators must initiate procedures to ensure that raw milk meets the following criteria:

Raw cows' milk:

- Plate count at 30 °C (per ml) ≤ 100 000 (*)
- Somatic cell count (per ml) ≤ 400 000 (**)

(*) Rolling geometric average over a two-month period, with at least two samples per month.
(**) Rolling geometric average over a three-month period, with at least one sample per month, unless the competent authority specifies another methodology to take account of seasonal variations in production levels.

Kosovo quality standards and grade of raw milk

Kosovo standard about food law and quality standards about milk and milk products:

- "Law on Food" No. 03/L-016,
- "Quality standards and grade of fresh milk" Administrative instruction MA-No.20/2006
- "Decision" On grading of fresh milk of the cow, sheep and goats for the calendar year 2006 and 2007 under the number of micro - organisms and somatic cells;

Milk quality –what is milk and production of quality milk

- Composition of milk
- Bacterial and cell count
- Sediment
- Density
- Storage time of the milk

The influence on the milk quality from bacterial contamination:

- Souring of the milk and rancid taste or strong ammonia smell;

- Of tastes, alcohol production and toxins in the milk products;
- Product range and shelve live of the processed products;

Milking Solutions

1. Portable Bucket Milker
2. Bucket Set Installation
3. Pipeline milking system
4. Milking Parlour
5. Solutions for Sheep & Goats

Milking Procedures and equipment sanitation

The ideal milking procedure includes each of the following eight steps:
Pre-milking Observations; Forestripping; Teat Sanitation; Attachment; Adjustments; End of Milking; Removal; Sometimes is better to skip a step; doing a step incorrectly may be worse. To do the ideal milking procedures is necessary to discussed with everyone involved in milking. Changing old habits won't be easy, but is worth the effort.

Proper cleaning procedures: Preparing area, equipment and personnel for cleaning, Pre-cleaning - physical (dry); Pre-rinsing; Chemical cleaning with alkaline solution and acid solution; Inspection and re-cleaning, if necessary; Sanitizing.

Milk handling and storage

It is important that the consistency and quality of milk does not change during storage. In order to store milk and maintain high milk quality, proper cooling equipment is essential. Determining the suitable type of cooling equipment is depending of the daily milk volume; the number of milkings for storage (total storage capacity); cooling capacity; environment temperature;

MCC (milk collection centers)

- Operating of Milk collection points and centers;

Transport of raw milk and milk collection route

- Ways of transport of raw milk to the dairy plant;

Milk payment

- Agreements for purchasing of raw milk;

Mastitis

- Prevention and relation with high SCC;

Lecture on sampling and sampling handling

- Proper sampling and labeling;

Filed methods/tests for Milk quality control

- Alcohol test with 68%, 72% and 75% etilalcohol;

Milk falsification with raw milk

- Falsifications - aiming increasing the volume of the milk added water;
- Falsifications, when unusual substances are added (flour, sugar, salt, skim milk, whey)
- Mixing different kinds of milk and offering it as more valuable kind.

Independent Lab. for testing of raw milk

- Authorized laboratories for raw milk quality control;

During the lecture, all critical points that affect the microbiological quality of the milk, starting with preparation of the cows for milking and ending with the distribution of the milk, were emphasized.
At the end of the workshop all attendees were given written material containing the procedure for production of the quality raw milk-Milk Management, and printed copy for each student with Kosovo standards about raw milk.

June 12, 2009

Workshop for: Training Interns in Milk Quality Field Work
Location: **conference room at KPEP, Pristina**
Location: afternoon at **Dairy Plant "Bylmeti**"

In the morning we had workshop at the conference room in KPEP and after that training at dairy plant "Bylmeti".

At dairy plant Bylmeti training was performed for students in order to see all procedures during milk receiving and testing at the dairy plant especially:

- Proper sampling (samples of the raw milk for chemical and microbiological analysis) at the time of receiving of the milk at the dairy;
- Control of temperature during intake of the raw milk from the milk collection truck;
- Preparation of the alcohol test for determining the freshness of the raw milk: preparation of 68-70% solution of ethyl alcohol, testing of the milk and proper evaluation of the results from the test;
- Testing of raw milk with Beta-Star antibiotic test with preheated incubator, and after incubation interpretation of test results.
- Usage of Lacto- scans for determination of the chemical parameter of the milk.

From June 15 to June 19 on farm training for student participants at the project was held in order to practically educate students about:

- How farmers to produce high quality raw milk with high price how they can control them and help them to produce high quality milk;
- The basic and main factors which define raw milk quality: Total bacteria number,Number of somatic cells, Chemical composition-proteins, milk fat and lactose.
- How the external environment is affecting milk quality like: dust and filth, milking equipment, milking accessories and etc.

- Other very important factors for milk quality like hygiene condition of the dairy farm, general health condition of the dairy cows during the lactation period, good hygiene of the milker.

June 15, 2009 on farm training with students, Pejë/Peć region

Five different farms, and 2 milk collection points cooperate with dairy plant “Devolli” at the region of Pejë/Peć (at villages Lozan and Trestenik)–students were trained for: production of milk with high microbiological quality, testing for sub clinical mastitis, using adequate tools and chemical solutions. I have practically demonstrated proper milking procedures and proper cleaning procedure for cleaning milking machines, milking containers and lacto freezers. On the farm training special attention was pointed on: Farm hygiene, Milking hygiene (udder), Milking Equipment and performing Mastitis Tests for determination of cows with subclinical mastitis and interpretation of laboratory results received from dairy plant.

All procedures that are important for production of high quality raw milk were pointed out.

At the milk collection points the propose of presentation was to train the students about proper technical condition for operating of Milk Collection Centers to maintain the milk quality up to the moment of delivery to the dairy plant.

June 16, 2009 on farm training with students, Prizren region

During the day we visited the MCC and 3 farms that were selected from the owner of dairy plant ABI from Prizren. Farms were located in village “Ratkov” were I practically demonstrated to the students:

"Good Hygiene Practice" at the farm with:

- Hygiene at the stables (cleaning, disinfection and ventilation);
- Hygiene of the milkers, hygiene of the milking (preparation of the udder, control of the vacuum and pulsations in the milking system, control of the rubber parts of the milking machine);
- Cooling of the milk; cleaning of the milking equipment and storage of the milk (choosing of cleaning chemicals and disinfectants for cleaning the milk equipment, choosing of cleaning equipment, procedure for cleaning of the milking equipment and other equipment and utensils);
- Testing dairy cows for sub clinical mastitis and proper therapy treatment of the infected cows.

Students were interested and asked questions about: proper application of Mastitis Test (MT), proper evaluation of the mastitis test results and proper choice of cleaning solution. All procedures that are important for production of high quality raw milk were pointed out.

June 17, 2009 Pristina region

During the day we visited the MCCs and farms that were selected from the owner of dairy plant “Magic Ice” at two different villages.
On the farm I have demonstrated to the studens proper operating procedures pointing toward high quality milk production. Especially we pointed out what farmers need to put into every day practice proper cleaning procedure for cleaning milking machines, like using proper cleaning brushes and a 0, 5 % water solution of alkaline solution. During the

presentation I have examined all places and factors influencing and enlarging milk contamination and discussed with students how to avoid all this negative factors. After that, we have discussed about the number of pulsations (normally it should be 50 – 60/ minute) and vacuum in the tits cups (normally should be 48-50 Pa) and next topics was a demonstration of proper way of milking. The proper procedure of washing and disinfecting the udder was presented (Desul), and tits drying by using paper tissues. The procedure of identifying dairy cows infected with sub-clinical mastitis using the Mastitis Tests, was also demonstrated. Different levels of sub-clinical mastitis with dairy cows were determined and method of treatment of diseased dairy cows was explained. Also students were very interested and asked questions about: proper evaluation of the mastitis test results and proper choice of cleaning solution.

June 18, 2009 on farm training, region of Gjilan/Gnjilane

During the day together with students we visited one of the biggest dairy farmer at the region of Gjilan/Gnjilane who sells the milk to the Dairy plant Kabi. On the farm we had a demonstration of:

- Proper way of milking: Washing and disinfecting the udder (DeSul), and tits drying by using paper tissues. The first milk spurt needs to be milked in a separate container in order to avoid collective milk contamination. After milking, each tit needs to be disinfected by using iodine disinfectant;

- The procedure of identifying dairy cows infected with sub-clinical mastitis using the Mastitis Test, was practically demonstrated. Different levels of sub-clinical mastitis were determined and method of treatment of diseased dairy cows was discussed;

- Proper cleaning of milking machines and lacto freezes by using proper cleaning brushes and a 0,5 to 1% solution of alkaline detergent and using solution at least 65˚C, in order to remove the milk fat layers.

June 19, 2009 Pristina region

During the day together with students we visited one of the biggest dairy farmers at the region of Pristina with 50 dairy cows. The premise is new with good construction that is suitable for dairy cows farm breed inside of the farm. The dairy plant is equipped with machine milking system and lacto freezer for cooling the milk. The basic conditions for production of high quality raw milk exist. Raw milk from this farm is delivered to Bylmeti dairy plant. On the farm I have demonstrated to the students' proper operating procedures pointing toward high quality milk production. During the presentation we have examined all places and factors influencing and enlarging milk contamination and discussed with students how to avoid all this negative factors. After that, we have discussed about the number of pulsations and vacuum in the tits cups (normally should be 45-50 Pa) and next topics was a demonstration of proper way of milking. The proper procedure of washing and disinfecting the udder was presented (Desul), and tits drying by using paper tissues.
The procedure of identifying dairy cows infected with sub-clinical mastitis using the different Mastitis Tests, was also demonstrated.
We arranged another on farm training on this farm for practical cleaning of all milking equipment on June 24, when farmer will ensure hot water and braches for cleaning.

June 22, 2009

Preparing presentation and other materials for students and telephone discussion with Mr. Sali Golja owner of Agroshwitz Company and representative of DeLaval company Mr. Banje. We discussed about possibility to establish contact with student interns and provide them with manuals in Albanian language for disinfectants and different mastitis test and especially for alkaline or acid solutions which are necessary in every day cleaning procedures.

June 23, 2009

Workshop was performed at the KPEP office about final conclusion and findings and to give the certificates to the students.

We reviewed all important factors for milk quality and pointed out especially: proper milking management, proper cleaning procedures and storage of milk.

June 24, 2009 Pristina, Lipjan/Lipljane and Mitrovicë/Mitrovica region

On farm training at dairy farm with 50 milking cows near Pristina where during the previous week we demonstrated proper milking and mastitis control. This day milking machines were completely disjointed and washed by using proper cleaning brushes and a 0,5 % water solution of alkaline detergent (Alfa Laval). The temperature of the solution was at least 65˚C, in order to remove the milk fat layers. Then the whole equipment was washed with water. The same cleaning procedure was applied to the milking containers and lacto freezer. Washing of the equipment with an acid detergent followed, for the purpose of eliminating the milk stone from the surface of the equipment. The whole equipment was again rinsed with water, after which it was disinfected by using a disinfectant which farmer has on farm. During the demonstrative washing of the equipment, we have pointed out all places and factors influencing and enlarging milk contamination.

This day we also visited 4 more farms near Lipjan/Lipljane with students cooperates of dairy plant Bylmeti and had on farm training about milk hygiene and storage of milk.

Also we visited a veterinary station and agriculture shops in Mitrovicë/Mitrovica in order to discuss with employees about what they have from products intended for dairy farming and control of hygiene at dairy farm.

June 25-26, 2009

Preparing evaluation and monitoring forms for student interns and work on final report.

June 29, 2009

A meeting was held at which all finished activities were discussed and a schedule for the future activities on Grima Business Company was agreed upon as well as a schedule for Evaluation and Performance plan.

Training Schedule

Training to the milk quality field personnel /students	
Monday 8.6. 2009 .	-visiting Magic Ice Dairy Plant -visiting Kabi Dairy plant
Tuesday 9.6. 2009 10-15	Lecture Milk Quality Control ➢ EU Dairy Industry/USA dairy industry ➢ EU Regulation / Kosovo quality standards and grade of raw milk ➢ MILK QUALITY –what is milk and production of quality milk ➢ Milking Solutions
Wednesday10.6. 2009 10-15	Lecture Milk Quality Control ➢ Milking Procedures and equipment sanitation ➢ Milk handling and storage ➢ MCC (milk collection centers)
Thursday 11. 6. 2009 10-15	Lecture Milk Quality Control ➢ Transport of raw milk and milk collection route ➢ Milk payment ➢ Lecture on sampling and sampling handling ➢ MASTITIS
Friday 12.06. 2009 10-15	Lecture Milk Quality Control ➢ Filed methods/tests for Milk quality control ➢ Tasting of milk in the dairy plant ➢ Independent Lab. for testing of raw milk ○ Practical Training at “Bilmety” dairy plant
Monday 15 .6 2009	Devolli field visit/ farm practical training with students
Tuesday 16.6.2009	Abi dairy plant field visit/ farm practical training with students
Wensday17.6.2009	Magic Ice dairy plant field visit/ farm practical training with students
Tuesday 18.6.2009 Friday 19.6 2009	Kabi dairy plant field visit/ farm practical training with students Bylmeti field visit/ farm practical training with students
Tuesday 23.6.2009	In class training finding and conclusions
Wednesday 24.6.2009	On Farm practical training with students

TASK FINDINGS

At different farms, students were trained for: Milking Management (Proper milking procedures - Production of milk with high microbiological quality), Testing with CMT and proper interpretation of results, in order to determined sub-clinical mastitis, and Procedures for proper cleaning equipment.

Activities at each model farm were proceeding by the following schedule:

General condition on the farm

At each farm general inspection was done in order to record the defects at the premises, defects of the system and equipment for milking at the farms. We inspected condition of farm like proper ventilation, air cow barn and lightening inside of the premises, convenience of beds, convenience of waste disposal system, system for drinking water, and other everyday practice in farmers' work.

Findings from general condition on the farm:

Improper ventilation in most visited farms aloud to growth yeast and moulds and they are source of contamination of the raw milk by as in the air spores of these micro organisms.

Proper cleaning procedure

On farms, by using adequate tools and chemical solutions, proper operating procedures were practically demonstrated pointing toward high quality milk production. The proper cleaning procedure for cleaning milking machines, milking containers, and lacto freezers were demonstrated. The milking machines were completely disjointed and washed by using proper cleaning brushes and a 0,5-1% water solution of alkaline detergent (Alfa Laval). The temperature of the solution was at least 65°C, in order to remove the milk fat layers. Then the whole equipment was washed with gushing water. The same cleaning procedure was applied to the milking containers and lacto freezers. Washing of the equipment with an acid detergent followed, for the purpose of eliminating the milk stone from the surface of the equipment. The whole equipment was again rinsed with water, after which it was disinfected by using a disinfectant which farmers has. The equipment was rinsed once more with tap water. After cleaning we checked that no water or chemicals are left in the system.

During the demonstrative washing of the equipment, we have pointed out all places and factors influencing and enlarging milk contamination. After that, we have examined the number of pulsations (normally it should be 50 – 60/ minute) and vacuum in the tits cups (normally should be 48-50 Pa).

During the project implementation based on findings from visited farmers and from working directly with them, we came to the following findings about cleaning procedure of farm equipment:

- Practically none of the farmers is properly washing and disinfecting the milking equipment and using adequate cleaning tools and chemical solutions, and usually use the ordinary domestic detergents and sponges for cleaning. The large bacteria count in the milk is more due to its contamination from improper cleaning of equipment milking machines and containers, than as a result of bacteria presence in the surface of the equipment(fat and stone layers)
- Most of the farmers who are using a milking machine, do not know its operations and particular characteristics well (the normal number of pulsations, the normal vacuum in the tits cups, the preferable time span of using the rubber parts and rubber tubes)

which often results with an improper secretion of milk from the udder and subclinical mastitis occurrence.

During training biggest attention was devoted to students' training for proper cleaning procedures as well as to educating students on conducting trainings to farmers after the completed training.

When milking machines are used for milking, proper hygiene and cleaning is a must. If milk parts are not removed completely during cleaning from the all the equipment or water is left in the pipeline these places will be a source for bacteria growth and thus will contaminate the milk from the next milking period.

Hygiene of milking

The next procedure was a presentation of proper way of milking. The proper procedure of washing and disinfecting the udder was demonstrated, and tits drying by using paper tissue or proper cloth towel. The first milk spurt was milked in a separate container in order to avoid collective milk contamination. After milking, each tit was disinfected by using iodine disinfecting solution (Betadine).

Findings from farmers practice for milking procedures:

Before milking, farmers do not prepare the udder in a proper manner and do not use any solutions to disinfect the udder.
The procedure they usually apply is occasional washing of the udder with water, but without drying it, which creates favorable conditions for increased milk contamination and high individual bacteria number.
They also do not milk the first milk spurt in a separate container.
After milking, the farmers do not rinse the tits with an iodine disinfecting solution, which is one of the main reasons for subclinical and clinical mastitis occurrence.
Cows with mastitis are not always milked last and milk is added to the already collected milk.

Testing for mastitis

The procedure of identifying dairy cows diseased with sub-clinical mastitis using the California Mastitis Test was also demonstrated. Different levels of sub-clinical mastitis with dairy cows were determined and method of treatment of diseased dairy cows was explained and demonstrated.

Findings from farmers practice for determination of sub-clinical udder infection:

Most of the farmers do not know how and are not able to test the cows for presence of subclinical mastitis. Usually they start treating cows for presence of clinical mastitis, which in most cases causes permanent damage in the functioning of the udder.

Cooling and storage of the milk

At visited farms most the farmers had second hand milk cooling tanks (lactofreezer) which is also good to keeping and storage of milk. In cases that milk is picked up every day from dairy plan milk need to be cooled at 8°C and for every second day at 4°C. At several visited farm that were not equipped with the lacto freezer we demonstrated several ways of cooling the milk before milk is delivered to MCCs or picket up from dairy plant. Also proper cleaning by choosing adequate brushes and solution was practically was demonstrated to students and we cleaned with special attention the agitator and milk outlet valve.

Findings from farmers practice for cooling and storage of milk:

Visited farmers do not know how to properly clean the milk cooling tanks. They are using only tap water for cleaning and also inadequate brushes. Electricity problems also usually happens and for that cases farmers need to ensure some backup support like small aggregates or have special agreements with dairy plant. During transfer of milk from milk cans to lacto-freezers farmers used different filters. If a cloth filter is used the farmer has to realize the positional hazard when this filter is not used and cleaned in a proper way. Bacteria will grow in milk traces remaining in the cloth, every time new milk is passing the filter this milk is contaminated with the bacteria. To prevent this, the cloth should be washed properly with warm water and soap after which the cloth is rinsed with disinfectants and dried. Boiling of the cloth after washing is another possibility. In additional the cloth should be renewed regularly, at least once a month.

Training at the Milk Collecting Centers

At different collecting centers training was performed for students in order to see proper operating at the milk collecting centre. The goal was to train students how to maintain good hygiene level at the milk collecting centers and to maintain the quality of the milk until distribution to the dairy plant. On the training, demonstration was performed on:

- Proper sampling and labeling the samples of the milk for chemical and microbiological analysis,
- Control of the temperature during intake of the milk from the farmers;
- Control of the milk quality during intake of the milk from the farmers with alcohol tests.
- Choosing of cleaning chemicals for cleaning and disinfection of the premises, equipment for milk storage and other assisting utensils;
- Usage of pH meter and Lacto scan, most frequently used eqipment in MCC, (determination of the chemical parameters of the milk and pH level)

Cleaning procedure at MCCs: The following proper operating procedures were demonstrated to students at MCCS for cleaning of milk cooling tanks using adequate tools and chemical solutions:

- Preparing area, equipment and personnel for cleaning;
- Pre-cleaning - physical (dry);
- Pre-rinsing;
- Chemical cleaning with alkaline solution and acid solution;
- Inspection and re-cleaning, if necessary;
- Sanitizing

Trained students for raw milk quality control should constantly monitor the following:

1. Conditions and operating procedures at the dairy cows' farm;
2. Conditions and operating procedures at the MCCs;
3. Milk collecting and transportation;
4. Raw milk reception at the dairy plant;

CONCLUSIONS AND RECOMMENDATIONS

During the project implementation, we have performed training for student interns in different farms on different locations in Kosovo. Based on results from visited farmers and from working directly with them, as well as from the laboratory results from KVFA for each farm, we emerged with the following conclusions:
Most of the problems with low milk quality come from the improper dairy farm management especially improper milking procedures and improper cleaning of equipment.
Trained students need to be focused on improving milk quality with transfer of knowledge received during this practical training.
Students will gather and transmit information among farmers, dairy processors and KVFA laboratory in order to facilitate communication.

During the regular farm visits they should check at every farm:

Preparing the cow for milking: The exterior of the cows' udder should be free from dirt and manure. This in order to prevent dirt to enter into the milking bucket and the milk. Cleaning of udder and teats before milking is the best quarantine for high quality milk as far as cleanliness is concerned. Removal of rough dirt from the udder with tepid water; Disinfecting the udder with a disinfecting solution; (Using different disinfectant or sanitizer tablet with dissolving in warm water in the bucket which is used for udder cleaning and putting of towels in the bucket). Drying the udder with paper towel/tissue; It is strongly recommended the first milk spurt to be always milked in a separate container (same container for all cows). After milking, all four tits should be dipped in/rinsed with an iodine disinfecting solution to protect the teat canal from entering environmental bacteria which cause mastitis.

Preparation of milking equipment: Before milking: Disinfecting the milking machine, proceeding immediately to milking, with a disinfecting solution;
Immediately after milking, the milking machine and other containers used during milking, should be rinsed with lukewarm water until the water becomes clear (until clean and pure water is seen); After that, an alkaline solution should be prepared (50 - 70 g/10 l. water) and used to wash and rinse the entire equipment. Its temperature should be 60-70°C. Proper cleaning brushes should be used for the washing, and no sponges. Sponges should be pushed out of use. The rubber parts of the milking machine should be cleaned in the same manner. After washing with an alkaline detergent, the entire equipment should be rinsed with a tap water to ensure elimination of any alkaline detergent residue. This procedure should be repeated every day. Once to twice a week, an acid solution should be prepared (50- 70 g/10 l. water) and used to wash the whole equipment. The solution's temperature should be 60-75° C. Proper cleaning brushes should be used for the washing.
If in certain parts of the milking system flexible hoses are used, these should receive special attention as will deteriorate after some time, producing cracks in which remaining milk particles are causing bacteria growth.

Controlling the milking machines and their operational characteristics: Introduce periodical inspections of the number of pulsations (normally 50 – 60/ minute) and vacuum in the tits cups (normally 45-50 Pa). The rubber part of the tits cups should be replaced on regular basis after 6 months.

Milk manipulation after milking: Immediately after milking, milk should be strained through filter previously disinfected. If a cloth filter is used the farmer has to realize the potential hazard when this filter is not used and cleaned in a proper way. The cloth should be washed properly with warm water and soap after which the cloth is rinsed with disinfectants and

dried. Boiling of the cloth after washing is another possibility. In additional the cloth should be renewed regularly, at least once a month.

Dairy cows testing for presence of sub clinical mastitis: Once a month, farmers should conduct dairy cows testing by using quick detecting tests for sub clinical mastitis presence, and provide adequate treatment to the diseased cows.

Milk Cooling: In the first two hours after milking, the milk should be cooled down under 8 ºC or 4°C If the milk is delivered every second day or in the collecting centre immediately after milking need to be delivered to MCCs. freezers. If the farmers don't have lacto freezers, the cooling of the milk can be done by tab water, ice or freezers for deep freezing.

The students with the technical assistance will enable dairy farmers to upgrade and begin meeting processors' demand for high-quality raw milk.

Students as qualified field persons should work very closely with:

- Dairy plants to assist in improving the quality of raw milk: dairy needs to share information about laboratory test result and operating procedures for milk collecting, transportation and raw milk reception at the dairy plant.
  Every dairy needs to have agreements for purchasing of raw milk where both sides know their obligation and rights about milk quality and milk payment.

- Work close with employees who are collecting milk;
  Every dairy need develop and implement according the HACCP principals, written procedures for collecting of milk directly from farms, procedures for collecting of milk from MCCs and procedures for collecting milk from every other suppliers, like from other dairy plant, or collection truck.

- Work close with MCCs, because of the existing average farm size student works with milk collection centers also will be of great benefit in improving the quality of raw milk.

- Work close with KFVA; all farmers indicated that results from the test laboratory are not objective in most cases. The decree requires processors to send samples from each producer or milk collection center twice per month to the Kosovo Food and Veterinary Agency (KVFA) laboratory for testing. Results are being sent back to the companies who are purchasing the milk and they then set payments to their farmers based on these limited tests. Farmers are not really happy about this and feel in some cases they are not being treated fairly because testing or payment calculations are not accurate.
  It is obvious that this problem need to be resolved with clearer understanding of a role of KVFA dairy laboratory, with sharing of the results also with farmers (and include students for help) or sent back trough regular mail results from testing not only to the dairy processors but also to farmers.
  I strongly recommended an educational trip to Krizevci, Croatia for people from KFVA, farmers and trained students to be organized. They have establish national authorized dairy laboratory first in the south-east Europe and operating very well and experience from there to be implemented in Kosovo.

Dairy plants do not have the funds to invest in facility modernization or expansion, nor in education and training and this practice oriented service from the students needed to be supported by different government and non-government institution. However, to compete effectively, Kosovo's dairy sector needs to improve the quality of raw milk, improve the quality of finished products, with conformation of international standards trough developing of different range of dairy products and more added value products. Good example for this is

dairy plant “Devolli” which only produce UHT milk and exiting good milk processing equipment is not effectively used. If they the just introduce drinking yogurt or sour cream in their daily production additional need of raw milk will have serious impact on stable farm production.
Increasing the flock size is beneficiary only if the farmer has proven to manage high milk yields and education of farmers is practically a precondition for successful investments in the dairy farming.
An irregular supply of electricity, high fuel costs and poor rural roads hinder the dairy sector especially with reduction of collection of milk during summer period from some dairies and reduction of price (some farmers receive 0.18). Farmers need some subsides in order to be successful in the long term.
I would like to add that for the all group of students this was first time to participate in this type of training and for their confidence the local consultant company “Grima” will be in close relationship and monitor performance of the students. Also my assistance or needs of help during t all time of training implementation will be possible trough e-mail communication, cell phones or because of close distance between Kosovo and Macedonia (one hours and a half driving) is possible to be present directly on the field.
In conclusion I would like to thank to USAID/KPEP and students interns for the opportunity to develop and conduct this training and I think that whole dairy industry will have benefits in the short and long term.

Raw Milk Quality Training Program, Pristina, June 2009

From top *left to right: Azem Halili, Fidan Luzha, Mentor Alishani, Gursel Arifi, Driton Morina, Artan Studenica, Alban Spahiu, Kreshnik Vejsa, Jordan Nikolov, Egzon Zhitija, Adil Maloku, Ahmet Osmani*

ANNEXES

Annex I ------- Kosovo MAFRD Quality Standards and Grade of Fresh Milk/A.I. No.20/06

Annex II ------- Decision on grading of raw milk of the cow, sheep and goat

Annex III------ Regulation (EC) 853/2004, section IX –raw milk primary production

Annex IV-------Evaluation form for students performance

Annex V-------- Certificate for participation of the raw milk quality training program

Annex I.

Kosovo MAFRD Raw Milk Quality Standards

UNMIK IPVQ

PROVISIONAL INSTITUTION OF SELF GOVERNMENT
INSTITUCIONET E PËRKOHSHME TË VETQEVERISË
PRIVREMENE INSTITUCIJE SAMOUPRAVLJANJA

GOVERNMENT OF KOSOVO/QEVERIA E KOSOVËS/VLADA KOSOVA

MINISTRY OF AGRICULTURE, FORESTRY AND RURAL DEVELOPMENT
MINISTRIA E BUJQËSISË, PYLLTARISË DHE ZHVILLIMIT RURAL
MINISTARSTVO POLJOPRIVREDE, SUMARSTVA I RURALNOG RAZVOJA

Minister of the Ministry for Agriculture Forestry and Rural Development taking into account the UNMIK Regulation No.2001/19, 13 September 2001 on the Executive Branch of Constitutional Framework for Provisional Institutions of Self – Government in Kosovo, Article 1.3 point (d) article from the paragraph 1.3, point (d) and the article 20 paragraph 20.1 point (a) of the Kosovo Livestock Law No. 2004/33, 08 September 2004,

Approves the following:

ADMINISTRATIVE INSTRUCTION MA – No. 20/2006

QUALITY STANDARDS AND GRADE OF FRESH MILK

Article 1
Purpose

With this Administrative Instructions is defined the parameters of quality fresh milk, quality verification way, grading of fresh milk under the quality and taking of samples for the analyses.

Article 2

Fresh milk under this Administrative Instruction is a natural secretion of milk glandule taken by one or more regular milking and without stopped of milking health animal, well - fed 30 days prior the procreation and 8 days after the procreation to who nothing is taken and concentrated.

Article 3

Fresh milk is graded under type of the milking animal in the following:

a) cow fresh milk
b) sheep fresh milk and
c) goat fresh milk.

Article 4

14. Fresh milk is also graded under the quality in four categories:
a) E - Extra Class,
b) I Class
c) II Class
d) III Class
4.2 Under categories qualities parameters of milk are regulated with a special decision by ministry.

Article 5

Price of fresh milk is defined based on the agreement of producers and processors under the modification of the correction factor defined with a Decision which will be issued by Ministry.

Article 6

Fresh milk must have a view, color, taste and specific aroma under the type of milking animal.

Article 7

It is collected a milk to who is certified the content under the analytic methods.

Article 8

After milking, fresh milk must be cold in temperature of 4ºC.

Article 9

The evidence of the assessment to freshness and quality will be issued only by the authorized laboratories.

Article 10

Fresh milk which is put in the circulation must meet the following conditions:

I Cow milk:

1. Taken by the cows 30 days prior the procreation and at least 8 days after the procreation
2. Being with the similar color from the white to the pale yellow,
3. Having the aroma and specified taste of milk,
4. Having the specified weight in the temperature of 15ºC not lower than 1.028 g/cm3 and not bigger than 1.032g /cm3,
5. Point of the freezing must be lower than -0.517ºC,
6. Contain at least 3.2% milk fat,

7. Contain at least 3.0 % protein,
8. Contain at least 8.5 dry matter without milk fat,
9. Acidity level to be from 6.5 – 7.8 determined rate under the method of the Soksklet – Henkel (ºSH).
10. The value of the pH is to be 6.5 – 6.7.

II. Sheep milk:

1. Being with the same color from the white color to the white and yellow one,
2. Having the aroma and specific taste of milk,
3. Having a specific weight in the temperature of 15ºC not lower than 1.034 g/cm3 and not bigger than 1.040 g/cm3,
4. Point of the freezing must be lower than -0.56ºC,
5. Contenting not less than 4% fat milk,
6. Contenting not less than 3.8% protein milk,
7. Contenting at least 9.5% Solids Not Fat(SNF)
8. Rate of the acidity not to be higher than 12 determined rate under the Soksklet – Henkel's method (º SH).
9. The value of the pH is to be 6.5 – 6.7.

III Goat milk:

1. Being with the same color from the white color to the white into yellow one,
2. Having the aroma and specific taste of milk,
3. Having a specific weight in the temperature of 15ºC not lower than 1.024g/cm3 and not bigger than 1.040g/cm3,
4. Point of the freezing must be lower than -0.54ºC
5. Contenting at least 2.8 % milk fat,
6. Contenting at least 2.5% milk protein,
7. Contenting at least 7.5% Solids Not Fat(SNF)
8. Rate of the acidity not to be higher than 8 determined rate under the Soksklet – Henkel's method (º SH).
9. The value of the pH is to be 6.5 – 6.7.

Article 11

Fresh milk with the destination of processing industry mustn't keep mechanical residues or their traces.

Article 12

Fresh milk mustn't contain the added water.

Article 13
Taken of samples of the fresh milk for the analyzes

13.1 Taken of samples for commercial purposes to assess the milk fresh quality for bacteria and somatic cell count is done by milk processors twice (2) a month, based on the lowest

level of bacteria and somatic cell, milk fat, protein , grading in milk, which result in the average of two analyses.

13.2 Taken of samples for official analyses will be done by the officers of Kosovo Veterinary and Food Agency (in the following text KVFA) under the legislation in power.

Article 14

Taken of samples will be done under pre selection of the case and even that one for any analyses from two samples for the determination of:

1. The milk fat;
2. Milk protein;
3. Total bacteria colony count /ml
4. Somatic cells in the milk;
5. Point of the freezing and
6. Antibiotic and other residues.

Article 15

15.1 Taken of samples from the official person will be done with minutes of meeting in which ought to be evidenced: the owner, accurate time and date of taken sample, type of the analyze, quantity of the milk from which is taken the sample and quantity of sample,
15.2 Dishes for taking of sample must be cleaned and from the material that do not affect in the organoleptic, physical, chemical and microbiologic quality of the sample,
15.3 Sample must be closed and sealed,
15.4 Transport of the sample will be done with the adequate equipment that guarantees the storage of the characteristics of the sample.

Article 16

In the case of an identification of the residues and antibiotic the official accredited person for taken of samples may take the samples from the all equipments with regard to the store and cooling of milk in the point of collection milk to the identification of the polluted resource.

Article 17

Milk Qualities Analyzes

17.1 The referent methods for controlling of fresh milk quality are methods that will be used by the authorized laboratories.
17.2 The laboratory must present in written the technical instructions regarding the way of the realization of analyzing and use of equipments that will be used for the realization of the lab analyses.
17.3 These methods will be accredited by the ministry.

Article 18

Quality control of fresh milk should be done in the licensed labs equipped with measures equipments to whom is proofed the certificate for the metering accuracy.

Article 19

The authorized laboratory is obliged at latest on 14th day of the following month to introduce in written the ministry, producer and processor for data with regard to the average of quality of fresh milk.

Article 20

The accredited laboratory is obliged to notify KVFA, milk producer and processor on all analyses results within three (3) days of receiving the sample

Article 21

The authorized lab is obliged to keep the evidence of taken of samples, conservation, methods and date of the realization of analyzes as well as results of analyses. Results' data must be stored till 2 years, with the request of the party in contest may be taken decision to be stored longer.

Article 22

Decision on license of the authorized laboratory will be announce in the Kosovo Official Gazette.

Article 23

Collaboration relations of milk producers and processors are regulated with bilateral contract.

Article 24

This Administrative Instruction will be come effective by the day of its approval.

Prishtina ---------- 2006
Ministry of Agriculture, Forestry and Rural Development

Deputy Minister Tomë Hajdaraj

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Annex II.

Decision on grading of raw milk of the cow, sheep and goat milk under the number of bacteria count and somatic cell count, for 2006 -2007-2008 and 2009

UNMIK IPVQ

PROVISIONAL INSTITUTION OF SELF GOVERNMENT
INSTITUCIONET E PËRKOHSHME TË VETQEVERISË
PRIVREMENE INSTITUCIJE SAMOUPRAVLJANJA

GOVERNMENT OF KOSOVO/QEVERIA E KOSOVËS/VLADA KOSOVA

MINISTRY OF AGRICULTURE, FORESTRY AND RURAL DEVELOPMENT
MINISTRIA E BUJQËSISË, PYLLTARISË DHE ZHVILLIMIT RURAL
MINISTARSTVO POLJOPRIVREDE, SUMARSTVA I RURALNOG RAZVOJA

Based on the Article 4 point 2 of this Administrative Instruction MA – NO.20/2006 on Quality Standards and Grading of Fresh Milk, Ministry of Agriculture Forestry and Rural Development
Approves the following:

DECISION

On grading of fresh milk of the cow, sheep and goats for the calendar year 2006 and 2007 under the number of micro - organisms and somatic cells:

Type of the milk	Grading	Microorganism	Somatic cells	Correction
Cow milk	Extra class	< 100.000	< 400.000	1.15
	Class I	< 200.000	< 500.000	1.00
	Class II	< 500.000	< 600.000	0.95
	Class III	> 500.000	> 600.000	0.80
Sheep and Goat milk	Extra class	< 1.500.000		1.15
	Class I	< 2.000.000		1.00
	Class II	< 3.000.000		0.95
	Class III	> 3.000.000		0.80

On grading of fresh milk of the cow, sheep and goats for the calendar year 2008 under the number of micro - organisms and somatic cells:

Type of the milk	Grading	Microorganism	Somatic cells	Correction
Cow milk	Extra class	< 80.000	< 300.000	1.15
	Class I	< 100.000	< 400.000	1.00
	Class II	< 200.000	< 500.000	0.95
	Class III	< 500.000	< 600.000	0.80
Sheep and Goat milk	Extra class	< 1.300.000		1.15
	Class I	< 1.500.000		1.00
	Class II	< 2.000.000		0.95
	Class III	> 2.000.000		0.80

For the grading of fresh milk of the cow, sheep and goats for the calendar year 2009 under the number of micro - organisms and somatic cells:

Type of the milk	Categorization	Microorganism	Somatic cells	Correction
Cow milk	Extra	< 50.000	< 200.000	1.15
	Class I	< 80.000	< 300.000	1.00
	Class II	< 100.000	< 400.000	0.95
Sheep and Goat milk	Extra class	< 500.000		1.15
	Class I	< 1.000.000		1.00
	Class II	< 1.500.000		0.95

Prishtina ---------- 2006

Deputy Minister of Ministry
Of Agriculture, Forestry
And Rural Development

Tomë Hajdaraj

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Annex III.

Regulation (EC) 853/2004, SECTION IX: RAW MILK AND DAIRY PRODUCTS

From Consultants' Power Point Presentation to Student Interns EU Legislation on Milk Quality

RAW MILK — PRIMARY PRODUCTION

HEALTH REQUIREMENTS FOR RAW MILK PRODUCTION;

Raw milk must come from animals:

- That do not show any symptoms of infectious diseases, good general state of health;
- do not have any udder wound or a recognisable inflammation of the udder;
- In particular as regards brucellosis and tuberculosis cows belonging to a herd which is free or officially free of brucellosis and tuberculosis;

HYGIENE ON MILK PRODUCTION HOLDINGS;

A. Requirements for premises and equipment
B. Hygiene during milking, collection and transport
C. Staff hygiene

CRITERIA FOR RAW MILK

- **HYGIENE ON MILK PRODUCTION HOLDINGS;**

A. **Requirements for premises and equipment:**

- Milking equipment, and premises where milk is stored, handled or cooled must be located and constructed so as to limit the risk of contamination of milk;
- Surfaces of equipment that are intended to come into contact with milk (utensils, containers, tanks, etc. intended for milking, collection or transport) must be easy to clean and, where necessary, disinfect and be maintained in a sound condition. This requires the use of smooth, washable and non-toxic materials;
- After use, such surfaces must be cleaned and, where necessary, disinfected. After each journey, or after each series of journeys when the period of time between unloading and the following loading is very short, but in all cases at least once a day, containers and tanks used for the transport of raw milk must be cleaned and disinfected in an appropriate manner before re-use.

B. **Hygiene during milking, collection and transport:**

Milking must be carried out hygienically, ensuring in particular: before milking starts, the teats, udder and adjacent parts are clean, that milk from each animal is checked for abnormalities by the milker or a method achieving similar results and that milk presenting such abnormalities is not used for human onsumption;

- the identification of animals undergoing medical treatment likely to transfer residues to the milk, and that milk obtained from such animals before the end of the prescribed withdrawal period is not used for human consumption;
- that teat dips or sprays are used only if the competent authority has approved them and in a manner that does not produce unacceptable residue levels in the milk.
- Immediately after milking, milk must be held in a clean place and It must be cooled immediately to not more than 8 °C in the case of daily collection, or not more than 6 °C if collection is not daily;

During transport the cold chain must be maintained and, on arrival at the establishment of destination, the temperature of the milk must not be more than 10 °C

C. **Staff hygiene**

- Persons performing milking and/or handling raw milk must wear suitable clean clothes.
- Persons performing milking must maintain a high degree of personal cleanliness. Suitable facilities must be available near the place of milking to enable persons performing milking and handling raw milk to wash their hands and arms.

➢ **CRITERIA FOR RAW MILK-**Food business operators must initiate procedures to ensure that raw milk meets the following criteria:

✓ **raw cows' milk:**

- **Plate count at 30 °C (per ml) ≤ 100 000** (*)
- **Somatic cell count (per ml) ≤ 400 000** (**)

(*) Rolling geometric average over a two-month period, with at least two samples per month.
(**) Rolling geometric average over a three-month period, with at least one sample per month, unless the competent authority specifies another methodology to take account of seasonal variations in production levels.

✓ **raw milk from other species:**

- **Plate count at 30 °C (per ml) ≤ 1 500 000 (*)**

(*) Rolling geometric average over a two-month period, with at least two samples per month.

if raw milk from species other than cows is intended for the manufacture of products made with raw milk by a process that does not involve any heat treatment, raw milk must meets the following criteria:

- **Plate count at 30 °C (per ml) ≤ 500 000 (*)**
- (*) Rolling geometric average over a two-month period, with at least two samples per month.

➢ **CRITERIA FOR RAW MILK-**:

Without prejudice to Directive 96/23/EC, food business operators must initiate procedures to ensure that raw milk is not placed on the market if either:

- it contains **antibiotic residues** in a quantity that, in respect of any one of the substances referred to in Annexes I and III to Regulation (EEC) No 2377/90 (1), exceeds the levels authorised under that Regulation;
- or the combined total of residues of antibiotic substances exceeds any maximum permitted value.

Annex IV.

Evaluation form for student's performance

Evaluation and Monitoring Students Performance **Milk Quality Training Program** **USAID KPEP**

EVALUATION FORM FOR STUDENTS PERFORMANCE

Dairy Plant	**Name of Student:**	**Name of the supervisor who performed this evaluation:** **Gursel Arifi "Grima" Consulting Company**
Name of the contact person from dairy plant	**Period of the Evaluation** From: To:	

In the list below, A means 'Acceptable', I means 'Needs improvement' and N means 'Not satisfied'.

No.	**Items**	**A/I/N**	**Comments**
1	Plan and Manage Visiting of Farmers		
2	The students needs to demonstrate ability to plan and organize the visiting the farmers: Prior to the evaluation, the documentation, including relevant documents and previous of activity reports can be review		
3	The plan for visiting describes: a) Number of farmers for visiting, contact lists b) Needed materials for training like CMT tests, other		
4	Number of realized visits of farms		
5	Given recommendation for general farm hygiene		
6	Given recommendation about using of different mastitis tests (MT) and interpretation of the results		
8	Given explanation about laboratory results and explanation about New Kosovo decision for grading of raw milk		
9	Able to make objective decisions base on analyzed information from Farm findings and milk storage, milk collection and milk transport from the dairy plant		
10	Able to understand and adapt to different situations. Know where to look and when to ask.		
11	Ability to report the findings from the farm visiting		
12	Able to make connection with other from group		

13	Other activity with cow breeder associations and cooperatives		

Rating	Summary
Acceptable	
Needs improvement	
Not satisfied	

RECOMMENDATION:

Expected results from each student	**At list 10 farmers will receive direct consulting service/month***	**At list 3 different training program per farmer**
Expected improvement of raw milk quality at list one class up at 40 % of assisted farmers		

*Some of the students can be move from one Dairy to another in case the dairy reducing collecting of milk from farmers and MCCs

Annex V.

Certificate for participation of the raw milk quality training program

USAID
NGA POPULLI AMERIKAN
OD AMERIČKOG NARODA

CERTIFICATE

Kosovo Private Enterprise Program (KPEP)
Programi për Ndërmarrjet Private të Kosovës Program za Privatna Preduzeca Kosovo

IT IS HEREBY CERTIFIED THAT

Has actively participated in the:

Raw milk quality training program

Using the participatory, with theoretical lectures and practical experience, the following topics were treated, among others:
EU Milk legislation
•Milking procedures and equipment sanitation
•Tasting of raw milk
•Milk payment

From 9 June, 2009 to 19, June, 2009 , at Pristina, Kosovo
The program was organize by USAID Kosovo Private Enterprise Program (KPEP)